What is claimed is:

1. A method of producing particles comprising the steps of:
contacting a polymer, a wax and/or a lipid that is a solid at standard temperature and pressure with a supercritical fluid to form a melt;
contacting the melt with a solution comprising a solute dissolved in a solvent to form a mass comprising:
a melt-rich fraction comprising the melt, a first portion of the supercritical fluid, and the solute, wherein the solute is in the form of solid particles that are dispersed in the melt; and
a supercritical fluid-rich fraction comprising a second portion of the supercritical fluid and the solvent; and
expanding the mass across a pressure drop to form composite particles comprising the polymer, wax and/or lipid and the solute.

2. The method according to claim 1 wherein the composite particles are collected in a collection vessel.

3. The method according to claim 2 wherein the temperature of the collection vessel is maintained above boiling point of the solvent.

4. The method according to claim 1 wherein the polymer is a polysaccharide, polyester, polyether, polyanhydride, polyglycolide (PLGA), polylactic acid (PLA), polycaprolactone (PCL), polyethylene glycol (PEG), or polypeptide.

5. The method according to claim 1 wherein the supercritical fluid is selected from the group consisting of carbon dioxide, nitrous oxide, dimethylether, C1-C6 alkane, C1-C6 alkene and alcohols.

6. The method according to claim 1 wherein the solute is a biologically active substance selected from the group consisting of drugs, pharmaceuticals, therapeutic agents, medicinal agents, viral materials, diagnostic aids, nutritional materials, proteins, peptides, antigens, enzymes, catalysts, nucleic acids and combinations thereof.

7. The method according to claim 1 wherein the solvent is selected from the group consisting of alcohol, toluene, ethyl acetate, methyl chloride, methylene chloride, dimethyl sulfoxide (DMSO) and dimethyl formamide (DMF).

8. The method according to claim 1 wherein the solute is present in the solution in an amount in greater than about 1 weight percent.

9. The method according to claim 1 wherein the solute is present in the solution in an amount greater than about 10 weight percent.

10. The method according to claim 1 wherein the solution further comprises a surfactant.

11. The method according to claim 1 wherein the composite particles have an average diameter of from about 0.5 micrometers (μm) to about 15 micrometers (μm).

12. Composite particles formed in accordance with the method of claim 1.

13. A method of producing particles comprising the steps of:

contacting a polymer, a wax and/or a lipid that is a solid at standard temperature and pressure with a supercritical fluid to form a melt;

contacting the melt with a solution comprising a solute dissolved in a solvent to form a mass comprising:

a melt-rich fraction comprising the melt, a first portion of the supercritical fluid, and the solute, wherein the solute is in the form of solid particles that are dispersed in the melt; and

a supercritical fluid-rich fraction comprising a second portion of the supercritical fluid and the solvent; and

extracting the solvent from the supercritical fluid-rich fraction; and

expanding the mass across a pressure drop to form solid particles comprising the polymer, wax and/or lipid and the solute.

14. The method according to claim 13 wherein the polymer is a polysaccharide, polyester, polyether, polyanhydride, polyglycolide (PLGA), polylactic acid (PLA), polycaprolactone (PCL), polyethylene glycol (PEG), or polypeptide.

15. The method according to claim 13 wherein the supercritical fluid is selected from the group consisting of carbon dioxide, nitrous oxide, dimethylether, C1-C6 alkane, C1-C6 alkene and alcohols.

16. The method according to claim 13 wherein the solute is a biologically active substance selected from the group consisting of drugs, pharmaceuticals, therapeutic agents, medicinal agents, viral materials, diagnostic aids, nutritional materials, proteins, peptides, antigens, enzymes, catalysts, nucleic acids and combinations thereof.

17. The method according to claim 13 wherein the solvent is selected from the group consisting of alcohol, toluene, ethyl acetate, methyl chloride, methylene chloride, dimethyl sulfoxide (DMSO) and dimethyl formamide (DMF).

18. The method according to claim 13 wherein the solute is present in the solution in an amount in greater than about 1 weight percent.

19. The method according to claim 13 wherein the solute is present in the solution in an amount greater than about 10 weight percent.

20. The method according to claim 13 wherein the solution further comprises a surfactant.

21. The method according to claim 13 wherein the composite particles have an average diameter of from about 0.5 micrometers (μm) to about 15 micrometers (μm).

22. Composite particles formed in accordance with the method of claim 13.

23. A method of producing particles comprising the steps of:

contacting a polymer, a wax and/or a lipid that is a solid at standard temperature and pressure with a solution comprising a solute dissolved in a solvent to form a load stock;

contacting the load stock with a supercritical fluid to form a mass comprising:

a melt-rich fraction comprising the supercritical fluid plasticized polymer, wax and/or lipid in the form of a melt, a first portion of the supercritical fluid, and the solute, wherein the solute is in the form of solid particles that are dispersed in the melt; and

a supercritical fluid-rich fraction comprising a second portion of the supercritical fluid and the solvent; and

expanding the mass across a pressure drop to form composite particles comprising the polymer, wax and/or lipid and the solute.

24. The method according to claim 23 wherein the load stock is first charged to a vessel and the supercritical fluid is pumped into the vessel containing the load stock.

25. The method according to claim 23 wherein the supercritical fluid is first charged to a vessel and the load stock is pumped into the vessel containing the supercritical fluid.

26. The method according to claim 23 wherein the polymer is a polysaccharide, polyester, polyether, polyanhydride, polyglycolide (PLGA), polylactic acid (PLA), polycaprolactone (PCL), polyethylene glycol (PEG), or polypeptide.

27. The method according to claim 23 wherein the supercritical fluid is selected from the group consisting of carbon dioxide, nitrous oxide, dimethylether, C1-C6 alkane, C1-C6 alkene and alcohols.

28. The method according to claim 23 wherein the solute is a biologically active substance selected from the group consisting of drugs, pharmaceuticals, therapeutic agents, medicinal agents, viral materials, diagnostic aids, nutritional materials, proteins, peptides, antigens, enzymes, catalysts, nucleic acids and combinations thereof.

29. The method according to claim 23 wherein the solvent is selected from the group consisting of alcohol, toluene, ethyl acetate, methyl chloride, methylene chloride, dimethyl sulfoxide (DMSO) and dimethyl formamide (DMF).

30. The method according to claim 23 wherein the solute is present in the solution in an amount in greater than about 1 weight percent.

31. The method according to claim 23 wherein the solute is present in the solution in an amount greater than about 10 weight percent.

32. The method according to claim 23 wherein the solution further comprises a surfactant.

34. The method according to claim 23 wherein the composite particles have an average diameter of from about 0.5 micrometers (μm) to about 15 micrometers (μm).

35. Composite particles formed in accordance with the method of claim 22.

36. A method of producing particles comprising the steps of:

contacting a polymer, a wax and/or a lipid that is a solid at standard temperature and pressure with a solution comprising a solute dissolved in a solvent to form a load stock;

contacting the load stock with a supercritical fluid to form a mass comprising:

a melt-rich fraction comprising the supercritical fluid plasticized polymer, wax and/or lipid in the form of a melt, a first portion of the supercritical fluid, and the solute, wherein the solute is in the form of solid particles that are dispersed in the melt; and

a supercritical fluid-rich fraction comprising a second portion of the supercritical fluid and the solvent; and

extracting the solvent from the supercritical fluid-rich fraction; and

expanding the mass across a pressure drop to form solid particles comprising the polymer, wax and/or lipid and the solute.

37. The method according to claim 36 wherein the load stock is first charged to a vessel and the supercritical fluid is pumped into the vessel containing the load stock.

38. The method according to claim 36 wherein the supercritical fluid is first charged to a vessel and the load stock is pumped into the vessel containing the supercritical fluid.

39. The method according to claim 36 wherein the polymer is a polysaccharide, polyester, polyether, polyanhydride, polyglycolide (PLGA), polylactic acid (PLA), polycaprolactone (PCL), polyethylene glycol (PEG), or polypeptide.

40. The method according to claim 36 wherein the supercritical fluid is selected from the group consisting of carbon dioxide, nitrous oxide, dimethylether, C1-C6 alkane, C1-C6 alkene and alcohols.

41. The method according to claim 36 wherein the solute is a biologically active substance selected from the group consisting of drugs, pharmaceuticals, therapeutic agents, medicinal agents, viral materials, diagnostic aids, nutritional materials, proteins, peptides, antigens, enzymes, catalysts, nucleic acids and combinations thereof.

42. The method according to claim 36 wherein the solvent is selected from the group consisting of alcohol, toluene, ethyl acetate, methyl chloride, methylene chloride, dimethyl sulfoxide (DMSO) and dimethyl formamide (DMF).

43. The method according to claim 36 wherein the solute is present in the solution in an amount in greater than about 1 weight percent.

44. The method according to claim 36 wherein the solute is present in the solution in an amount greater than about 10 weight percent.

45. The method according to claim 36 wherein the solution further comprises a surfactant.

46. The method according to claim 36 wherein the composite particles have an average diameter of from about 0.5 micrometers (μm) to about 15 micrometers (μm).

47. Composite particles formed in accordance with the method of claim 36.

48. An apparatus for producing composite particles comprising:
a vessel for receiving a comprising:
a polymer, a wax and/or a lipid that is a solid at standard temperature and pressure; and
a solution comprising a solute dissolved in a solvent;
a supercritical fluid supply in fluid communication with the vessel;
means to selectively control the flow of supercritical fluid from the supercritical fluid supply to the vessel to form a two-phase system comprising:
a first phase comprising:
the polymer, wax and/or lipid in the form of a melt; and
the solute in the form of solid particles that are dispersed in the melt; and
a second phase comprising the supercritical fluid and the solvent;
an expansion chamber; and
a nozzle in fluid communication between the vessel and the expansion chamber.